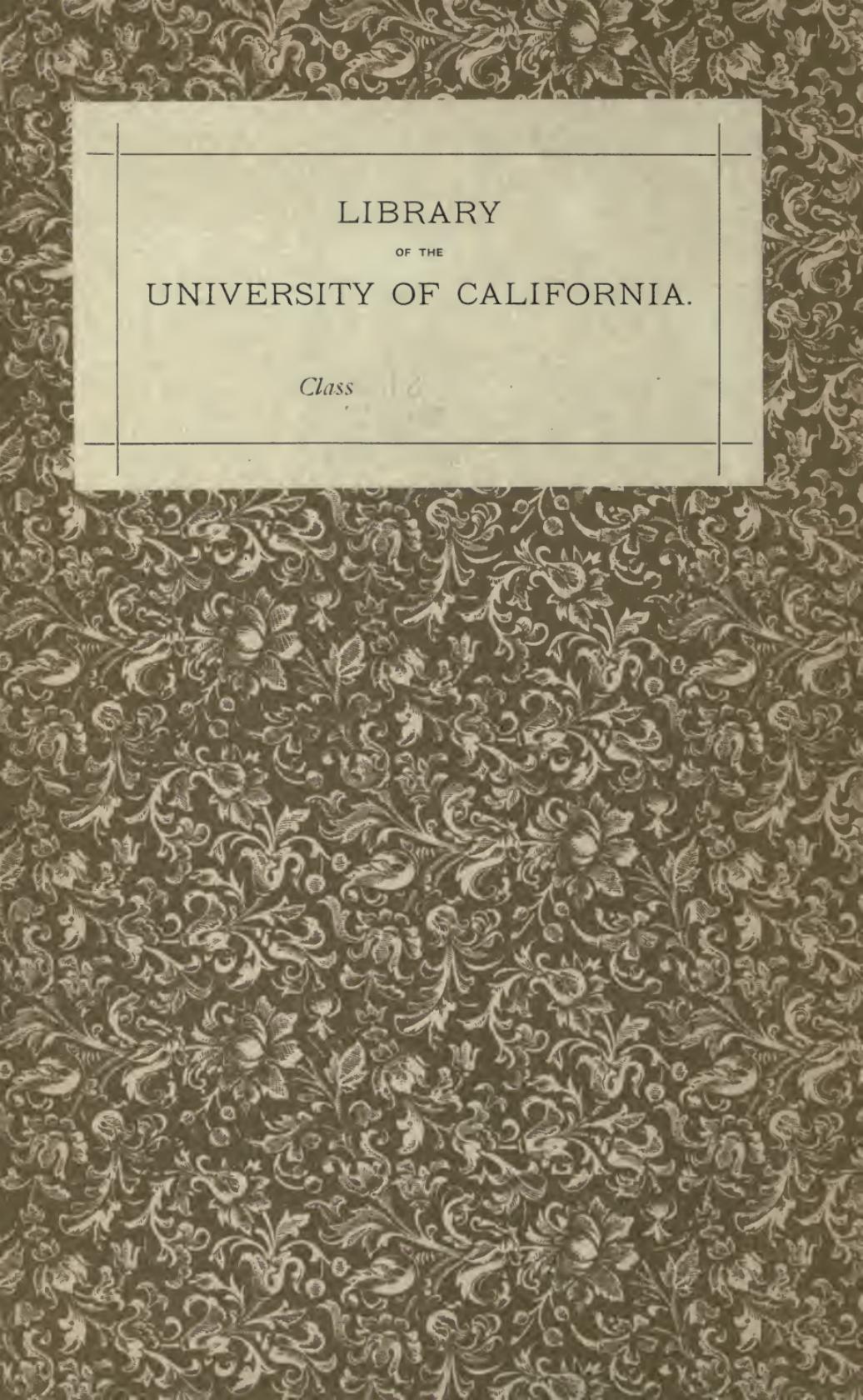


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THE PRINCIPLES  
OF  
BOOK-KEEPING  
BY DOUBLE ENTRY

BY

A. CAYLEY, Sc.D., F.R.S.,

SADLERIAN PROFESSOR OF PURE MATHEMATICS IN THE  
UNIVERSITY OF CAMBRIDGE.

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GENERAL

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GENERAL

## PREFACE.

THE Principles of Book-keeping by Double Entry constitute a theory which is mathematically by no means uninteresting : it is in fact like Euclid's theory of ratios an absolutely perfect one, and it is only its extreme simplicity which prevents it from being as interesting as it would otherwise be. But without entering into the question from this point of view, I remark only that I have endeavoured to exhibit the Principles in a thoroughly practical form, and by a simple example to show how they are in fact applicable to any kind of business transaction.

CAMBRIDGE,

*July* 1894.

# THE STATE

The State of New York is a member of the United States of America, and is one of the original thirteen States. It is situated in the northeastern corner of the continent, and is bounded by the Canadian Provinces of Ontario and Quebec to the north and west, by the Atlantic Ocean to the east, and by the States of Massachusetts, Connecticut, and Pennsylvania to the south. The State is divided into five principal regions, namely, the Adirondack, the Catskill, the Hudson, the Mohawk, and the Tugay. The Adirondack region is the largest and most mountainous, and is situated in the northwestern corner of the State. The Catskill region is situated in the north-central part of the State, and is the most elevated. The Hudson region is situated in the central part of the State, and is the most fertile. The Mohawk region is situated in the southeastern part of the State, and is the most populous. The Tugay region is situated in the southwestern part of the State, and is the most fertile. The State is divided into six principal counties, namely, Albany, Dutchess, Westchester, Sullivan, Ulster, and Warren. The Albany County is the largest and most populous, and is situated in the central part of the State. The Dutchess County is situated in the north-central part of the State, and is the most elevated. The Westchester County is situated in the central part of the State, and is the most fertile. The Sullivan County is situated in the southeastern part of the State, and is the most populous. The Ulster County is situated in the southwestern part of the State, and is the most fertile. The Warren County is situated in the northwestern part of the State, and is the most mountainous. The State is divided into six principal cities, namely, Albany, Binghamton, Elmira, Ithaca, Oneonta, and Saratoga. The Albany City is the largest and most populous, and is situated in the central part of the State. The Binghamton City is situated in the north-central part of the State, and is the most elevated. The Elmira City is situated in the central part of the State, and is the most fertile. The Ithaca City is situated in the southeastern part of the State, and is the most populous. The Oneonta City is situated in the southwestern part of the State, and is the most fertile. The Saratoga City is situated in the northwestern part of the State, and is the most mountainous.

THE STATE  
OF NEW YORK



## THE PRINCIPLES OF BOOK-KEEPING BY DOUBLE ENTRY.

**Account of Receipts and Payments.** This may be kept as follows: here and in other cases dates should be inserted when necessary.

		£	s.	d.
1.	Received	1	5	0
	"	2	15	0
	"	1	3	6
		<hr/>		
		5	3	6
	Paid	1	8	4
		<hr/>		
		3	15	2
	Received	10	0	
		<hr/>		
		4	5	2

&c.

being nearly the form in which a Depositor in a P. O. Savings Bank has his account made out for him. But the ordinary and convenient form is

	£.	s.	d.		£.	s.	d.
2. Received	1	5	0	Paid	1	8	4
"	2	15	0				
"	1	3	6				
"	10	0					
	<hr/>				<hr/>		
	5	13	6		1	8	4
	<hr/>				<hr/>		

Such an account is *balanced* by inserting on one or the other side the sum required to make the two

amounts equal: and the *balance* can then be carried to *n/a* a new account; thus

	£.	s.	d.		£.	s.	d.
3. Received	1	5	0	Paid	1	8	4
„	2	15	0	Balance <i>n/a</i>	4	5	2
„	1	3	6				
„		10	0				
	5	13	6		5	13	6
Balance	4	5	2.				

The employment as above of the expression Balance *n/a*, and the actual carrying down of such balance, is conducive to clearness, and may be adopted if thought necessary, but it would have been sufficient to write simply Balance, and not to carry down such balance.

**Debtor and Creditor.** When you receive money for a person, you become his *debtor* and he becomes your *creditor* for the amount; and when you pay money for him, he becomes your *debtor* and you become his *creditor* for the amount. And so if the money is received or paid for yourself, for a sum received you become debtor (to yourself) and for a sum paid you become creditor (of yourself). Suppose in the above-mentioned account the several sums are received and paid for A. B.; the account may be made out with a heading A. B. nearly in the foregoing form, thus

4.	<i>Dr.</i>		A. B.		<i>Cr.</i>			
		£	s.	d.	£	s.	d.	
	to Cash	1	5	0	by Cash	1	8	4
	„	2	15	0	Balance	4	5	2
	„	1	3	6				
	„		10	0				
		<u>5</u>	<u>13</u>	<u>6</u>		<u>5</u>	<u>13</u>	<u>6</u>
	Balance	4	5	2.				

And in exactly the same way if the moneys had been received and paid for yourself, the account would have had a heading, *Self*, thus :

*Dr.*                                      *Self.*                                      *Cr.*

### Several accounts of Receipts and Payments.

Suppose that you receive and pay moneys for sundry persons A. B., C. D., E. F. (including it may be, self). You keep a general account of receipts and payments, thus :

5.	Received		Paid
	£   s.   d.		£   s.   d.
	for A. B.    1   5   0		for A. B.    1   8   4
	C. D.    2 18   0		C. D.    1 12   0
	E. F.    3   4   0		E. F.    1 15   0
	A. B.    2 15   0		Balance   7   0   2
	„        1   3   6		
	„        10   0		
	<u>11 15   6</u>		<u>11 15   6</u>
	Balance       7   0   2.		

And you keep also the separate accounts of A. B., C. D. and E. F., thus :

6.	<i>Dr.</i>	A. B.	<i>Cr.</i>
	£   s.   d.		£   s.   d.
	to Cash       1   8   4	by Cash       1   5   0	
	Balance       4   5   2	„        2 15   0	
		„        1   3   6	
		„        10   0	
	<u>5 13   6</u>		<u>5 13   6</u>
		Balance       4   5   2.	
			1—5

7.	Dr.		C. D.		Cr.
		£ s. d.			£ s. d.
	to Cash	1 12 0		by Cash	2 18 0
	Balance	1 6 0			
		<u>2 18 0</u>			<u>2 18 0</u>
				Balance	1 6 0.

8.	Dr.		E. F.		Cr.
		£ s. d.			£ s. d.
	to Cash	1 15 0		by Cash	3 4 0
	Balance	1 9 0			
		<u>3 4 0</u>			<u>3 4 0</u>
				Balance	1 9 0.

You thus have Cash £7. 0s. 2*d.*, and the balances due to A. B., C. D. and E. F. respectively are £4. 5s. 2*d.*, £1. 6s. 0*d.* and £1. 9s. 0*d.*, making as they should do £7. 0s. 2*d.* This must be so, for each receipt or payment is entered *twice*, once in the general account of payments and receipts, and once in the separate account of the person interested.

This is *not* double entry ; but a slight modification makes it to be so.

**Impersonal Accounts; Cash.** You receive money; what do you do with it? You put it into your purse, or into a cash box, or pay it to your Bankers: in these several cases, your purse, or the cash box, or your Bankers become debtor for the amount. The purse or the cash box will pay it back to you when you require it, and in the last case the Bankers are without metaphor debtor to you for the amount. Without distinguishing the several cases, we (so to speak) personify "Cash" regarding it as a debtor for the amount received, and

as a creditor for the amount paid. And instead of the foregoing general account of receipts and payments, we have an account headed "Cash"; thus

9.	Dr.	Cash.		Cr.
		£ s. d.		£ s. d.
	to A. B.	1 5 0	by A. B.	1 8 4
	C. D.	2 18 0	C. D.	1 12 0
	E. F.	3 4 0	E. F.	1 15 0
	A. B.	2 15 0	Balance	7 0 2
	"	1 3 6		
	"	10 0		
		<u>11 15 6</u>		<u>11 15 6</u>
	Balance	7 0 2.		

**Balance Sheet.** The foregoing accounts 6, 7, 8 and 9 enable the formation of a *balance sheet*, thus

10.	<i>Debtors.</i>				<i>Creditors.</i>		
	£	s.	d.		£	s.	d.
Cash	7	0	2	A. B.	4	5	2
				C. D.	1	6	0
				E. F.	1	9	0
	<hr/>				<hr/>		
	7	0	2		7	0	2

It is obvious that the amounts on the two sides respectively must be equal to each other. Every item is in fact entered twice, once on the debtor side of some account, and once on the creditor side of another account. Thus the £1. 5s. 0d. received from A. B. appears on the creditor side of A. B.'s account, and also on the debtor side of the account, Cash; and similarly for every other item in the accounts. And we have herein the general principle of double entry: we introduce, when need is, impersonal accounts such as "Cash": every sum received is received from some

one, who becomes then a creditor for such sum, and it is paid to some one who becomes then a debtor for such sum; and the sum thus appears twice, once on the debit side of an account, and once on the credit side of another account: and the like as to every sum paid; it is paid to some one who becomes a debtor for such sum and by some one who becomes a creditor for such sum.

We have had so far as an impersonal account only "Cash," but we may have other impersonal accounts; as will appear by the example about to be given of the accounts for a manufacturing business.

**Impersonal Accounts—Capital, Plant, Interest, &c.** The above principle of double entry is applicable to transactions of any kind whatever. For instance, you set up a manufacturing business: you have at your Bankers £1600 which you call your Capital, and you borrow an additional £500. Your initial balance sheet is

11.	<i>Debtors.</i>	<i>Creditors.</i>
	£	£
Cash	2100	Capital 1600
		X. Y. 500
	<u>2100</u>	<u>2100</u>

You buy a factory for £400, and expend on Plant £500, and Materials £300, the several accounts are

12.	<i>Dr.</i>	<i>Cash.</i>	<i>Cr.</i>
	£		£
to Balance	2100	Factory 400	
		Plant 500	
		Materials 300	
		Balance 900	
	<u>2100</u>		<u>2100</u>

BY DOUBLE ENTRY.

13.	<i>Dr.</i>	<i>Factory.</i>	<i>Cr.</i>
		£	£
	to Cash	400	Balance 400
		<u>400</u>	<u>400</u>

14.	<i>Dr.</i>	<i>Plant.</i>	<i>Cr.</i>
		£	£
	to Cash	500	Balance 500
		<u>500</u>	<u>500</u>

15.	<i>Dr</i>	<i>Materials.</i>	<i>Cr.</i>
		£	£
	to Cash	300	Balance 300
		<u>300</u>	<u>300</u>

and your balance sheet now is

16.	<i>Debtors.</i>		<i>Creditors.</i>
	£		£
	Cash 900	Capital 1600	
	Factory 400	X. Y. 500	
	Plant 500		
	Materials 300		
	<u>2100</u>		<u>2100</u>

The meaning is quite clear ; you have done nothing to make yourself richer or poorer ; you have your Cash balance of £900 and your Factory, Plant and Materials which you consider to be of the values £400, £500 and £300 respectively—these being all of them real assets making up the original amount £2100; and this represents your Capital of £1600, and the borrowed £500. But suppose that you have besides spent £100 in Preliminary Expenses: you do not consider this as

lost money; it was a necessary expenditure; you make an account Preliminary Expenses, and your balance sheet is

17.	Debtors.		Creditors.	
		£		£
	Cash	800	Capital	1600
	Prel. Expenses	100	X. Y.	500
	Factory	400		
	Plant	500		
	Materials	300		
		<u>2100</u>		<u>2100</u>

The difference here is that Preliminary Expenses is not a real asset; it was as already mentioned a necessary expenditure, not to be regarded as a loss but which ought to be by degrees written off from the balance sheet as will be explained.

**Profit and Loss.** The number of the separate accounts to be kept will of course depend on the circumstances of the case, but there is always an account "Profit and Loss" which serves to balance all those accounts which it is desirable to exclude from the balance sheet. For instance the £500 to X. Y. bears interest at the rate of £5 per cent. per annum. His account for the year will be

18.	<i>Dr.</i>	X. Y.	<i>Cr.</i>	
		£	£	
	Balance	525	Balance	500
			Interest	25
		<u>525</u>		<u>525</u>

The £25 for interest credited to X. Y. must be debited to some other account, thus

19.	<i>Dr.</i>	<i>Interest.</i>	<i>Cr.</i>
		£	£
	to X. Y.	25	Balance 25
		<u>25</u>	<u>25</u>

and at the end of the year a part of the balance sheet will be

20.	<i>Debtors.</i>		<i>Creditors.</i>
		£	£
	Interest	25	X. Y. 525
		<u>25</u>	<u>525</u>

but here Interest is a fictitious or nominal asset, incapable of paying anything : and so in general money actually expended for any purpose whatever except in the purchase of property is a nominal or fictitious asset. Instead of retaining Interest as a separate account we carry it to "Profit and Loss," thus

21.	<i>Dr.</i>	<i>Interest.</i>	<i>Cr.</i>
		£	£
	X. Y. for Interest	25	Profit and Loss for Balance 25
		<u>25</u>	<u>25</u>

22.	<i>Dr.</i>	<i>Profit and Loss.</i>	<i>Cr.</i>
		£	£
	Balance of Interest	25	Balance 25
		<u>25</u>	<u>25</u>

the only difference being that in the balance sheet we have

	<i>Debtors.</i>		<i>Creditors.</i>
		£	£
	Profit and Loss	25	X. Y. 525

Profit and Loss being here (as was Interest) a nominal or fictitious debtor : but there are other items which

come into the Profit and Loss account, and let us hope Profit and Loss appears not as a debtor but as a creditor.

Thus suppose in the course of the year you consume Materials of the value of £200, you pay for wages and other expenses £500, and you produce goods which you value at £1000: your Plant originally worth £500, is depreciated, say by £10 per cent. and at the end of the year you consider it to be worth only £450: you also write off £20 from your Preliminary Expenses. The accounts are

23.	<i>Dr.</i>		<i>Cash.</i>		<i>Cr.</i>
		£			£
	Balance	800	Wages and Expenses		500
			Balance		300
		<u>800</u>			<u>800</u>

24.	Dr.	X. Y.	Cr.	
	£		£	
	3 Balance	525	1 Balance	500
			2 Interest	25
		<u>525</u>		<u>525</u>

25.	Dr.	<i>Preliminary Expenses.</i>		Cr.
		£		£
	Balance	100	Written off	20
			Balance	80
		<u>100</u>		<u>100</u>

26.	<i>Dr.</i>	<i>Factory.</i>	<i>Cr.</i>	
	£		£	
	to Cash	400	Balance	400
		<u>400</u>		<u>400</u>

27.	<i>Dr.</i>	<i>Plant.</i>	<i>Cr.</i>	
		£		£
	Balance	500	Depreciation	50
			Balance	450
		<u>500</u>		<u>500</u>
28.	<i>Dr.</i>	<i>Materials.</i>	<i>Cr.</i>	
		£		£
	Balance	300	Consumed	200
			Balance	100
		<u>300</u>		<u>300</u>
29.	<i>Dr.</i>	<i>Goods.</i>	<i>Cr.</i>	
		£		£
	Materials consumed	200	Estimated value	
	Wages and Expenses	500	of goods manu-	
	Profit and Loss for		factured	1000
	balance	300		
		<u>1000</u>		<u>1000</u>
30.	<i>Dr.</i>	<i>Profit and Loss.</i>	<i>Cr.</i>	
		£		£
	Interest	25	Goods	300
	Depreciation	50		
	Prel. Expenses	20		
	Balance	205		
		<u>300</u>		<u>300</u>

and your balance sheet now is

31.	<i>Debtors.</i>		<i>Creditors.</i>	
		£		£
	Cash	300	Capital	1600
	Prel. Expenses	80	X. Y.	525
	Factory	400	Profit and Loss	205
	Plant	450		
	Materials	100		
	Goods	1000		
		<u>2330</u>		<u>2330</u>

The several debtors other than Preliminary Expenses are here real assets ; viz. Cash £300 is money at the Bank, Factory £400 is the original value, Plant £450 is the original value less £50 for depreciation, and Materials £100 is the value of the unconsumed materials, and Goods £1000 is the estimated value of the goods produced, or it may be these have been made to order to be paid for at that price. The £80 Preliminary Expenses is a nominal or fictitious item, originally £100 but reduced to £80 by writing off £20, and which is intended to be ultimately written off altogether, say at the rate of £20 per annum, or in such sums as may be thought convenient.

On the other side we have capital £1600, nothing has been done to affect the amount of the capital invested in the business ; X. Y. £525, the original debt plus £25 for interest, and Profit and Loss £205, viz. this is you yourself, or in the case of Partners it is the Partners in the shares in which they are entitled. Thus the Partners being A. B. and C. D. in equal shares, the Profit and Loss account might have been balanced by debiting £102. 10s. to A. B. and the like sum to C. D., and then in the balance sheet instead of Profit and Loss £205 we should have had A. B. £102. 10s., and C. D. £102. 10s.

**Impersonal Accounts on Creditor side of Balance Sheet.** The Depreciation might have been arranged differently ; instead of writing off £50, the Plant might have been left at its original value £500, and Depreciation exhibited in the balance sheet as a creditor for £50.

So also we may have a credit item "Doubtful Debts." Suppose that there are various debts, amount-

ing in all to £600 due to the firm, but that some of these say for sums amounting to £200 are considered as doubtful: of course if absolutely despaired of these debts should be written off by carrying them to Profit and Loss, the credit amount of which would have been reduced accordingly—but they are only doubtful and it is desirable not to do this—to take account of them we must have on the credit side of the balance sheet an item “Doubtful Debts.” The balance sheet might stand thus

32.	<i>Debtors.</i>		<i>Creditors.</i>	
		£		£
	Cash	300	Capital	1600
	Prel. Expenses	80	X. Y.	525
	Factory	400	Depreciation	50
	Plant	500	Doubtful Debts	200
	Materials	100	Sundry Creditors	300
	Goods	1000	Profit and Loss	305
	Sundry Debtors	600		
		<u>2980</u>		<u>2980</u>

Here the item Depreciation in effect reduces the value of the Plant from £500 to £450, and the item Doubtful Debts reduces the amount Sundry Debtors from £600 to £400. But for these items Profit and Loss would have stood at £555, an over estimate arrived at by reckoning the Plant at its original value of £500 and the Sundry Debtors at £600.

### Concluding Remarks.

Observe that the accounts *always* balance—and thus may be made to prove anything: if you throw £100 into the sea, the sea becomes your debtor for that amount, it would appear in the balance sheet as debtor accordingly, and you appear as neither richer nor

poorer for the transaction. So if Plant bought for £500 is at the end of ten or twenty years reckoned as worth £500, the accounts will still balance and the amount to the credit of Profit and Loss be increased accordingly. The accounts require to be kept *honestly*; viz. in the balance sheet it is to be seen that the amounts due from the several debtors represent real assets, or say assets presumably capable of realisation—or when this is not so (as for example in the case of an item Preliminary Expenses not written off), it should be distinctly explained and understood that this is not a real asset. Or else there must be counterbalancing items introduced on the other side of the account, for instance if the Plant be retained at its original value or if debts known to be doubtful are reckoned at their nominal values, there must be on the other side of the account items “Depreciation” and “Doubtful Debts” as before appearing, so as to make the balance sheet exhibit the true state of affairs, and avoid the fool’s paradise of a fictitious amount to the credit of Profit and Loss.











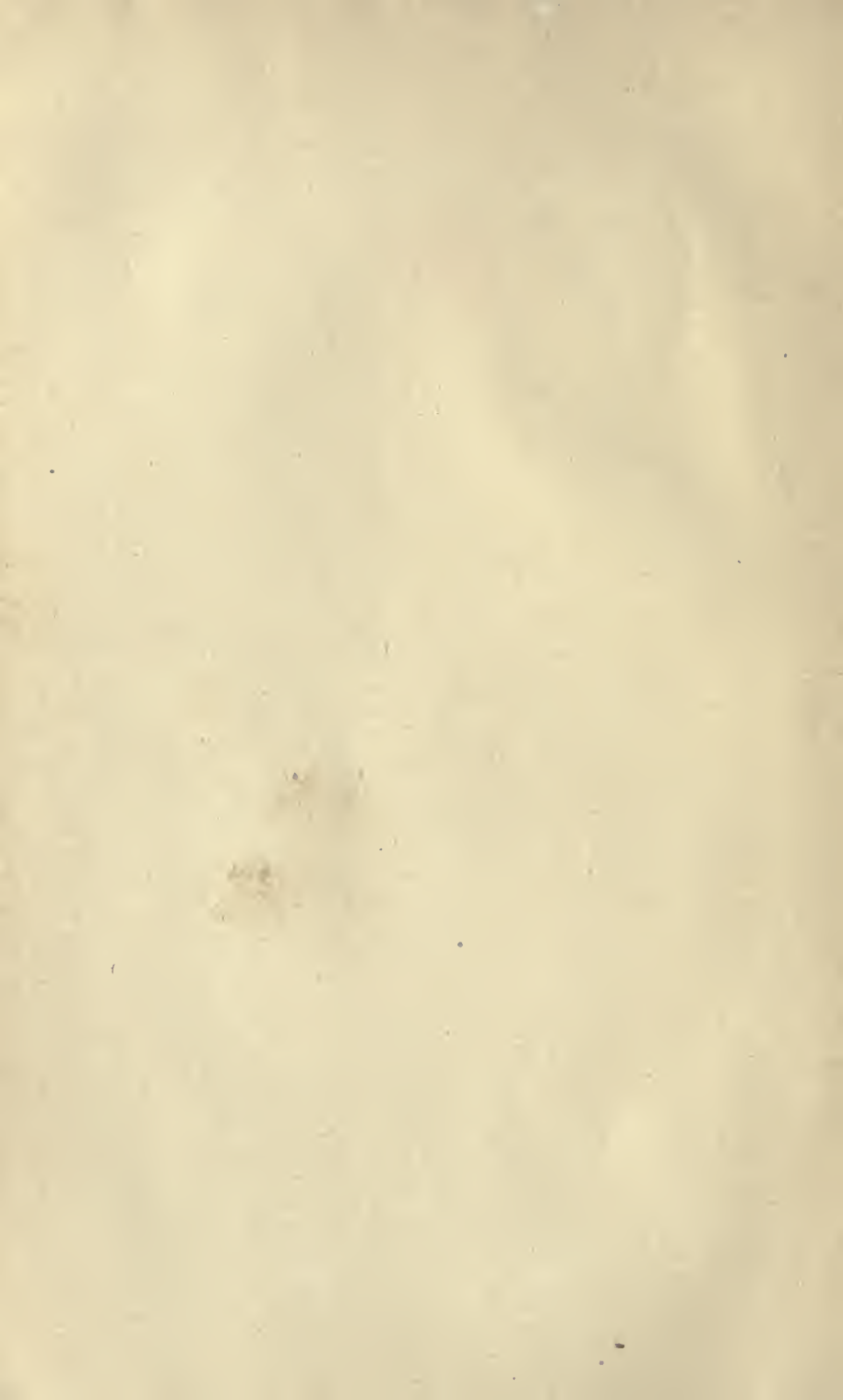














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